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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/718,851 | 11/22/2000 | Steve J. Shattil | CIDIV001 | 3170 |

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Steve Shattil
4980 Meredith Way #201
Boulder, CO 80303

| EXAMINER | |
|---|---|
| MEW, KEVIN D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2664 | |

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/718,851 | SHATTIL, STEVE J. | |
| | Examiner | Art Unit | |
| | Kevin Mew | 2664 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 November 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,16 and 17* is/are rejected.

7)☒ Claim(s) *14, 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2, 3*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

***Detailed Action***

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-13, 16-17** are rejected under 35 U.S.C. 102(e) as being anticipated by the admitted prior art, Agee (USP 6,128,276).

Regarding claim 1, Agee discloses in a carrier interferometry (CI) communications system, a method for communicating comprising:

providing for redundant modulation of at least one data symbol onto a plurality of carrier signals (spreader is redundantly modulating a first data with at least two of RF carriers, see col. 30, lines 56-59), the carrier signals having different values of at least one diversity parameter (stacked-carrier signals are separated based on spatial diversity of signals, see col. 5, lines 3-5 and lines 18-22),

providing for coupling the redundantly modulated carrier signals into at least one communication channel (a final summer combines the modulated carrier signals from all the channels and produces a transmitter output, see col. 10, lines 28-45 and element 170, Fig. 7A) from at least one transmitter element (from the stacked-carrier spread spectrum transmitter, see col. 10, lines 22-23 and element 150, Fig. 7A),

providing for reception of the coupled carrier signals (receiving at the splitter the received coupled carrier signals, see element 181, Fig. 7B) via at least one receiver element (stacked-carrier spread spectrum receiver, see col. 11, lines 16-17 and element 180, Fig. 7B),

providing for spatial processing of the received signals (providing spatial processing after the analog-to-digital conversion (ADC) process during the reception operation, see col. 7, lines 2-4) with respect to at least one diversity parameter space (based on spatial diversity, see col. 5, lines 18-22) to separate at least one desired data symbol from at least one interfering signal (to provide interference excision against in-cell stacked-carrier spread spectrum signals, see col. 5, lines 2-7).

Regarding claim 2, Agee discloses the CI communication method recited in claim 1 wherein the step of providing for redundant modulation includes providing for weighting of the carrier signals (a pair of gain-controlled amplifiers 162 and 164 permit the independent adjustment of each of the inphase and quadrature amplitudes of carrier signals, see elements 162, 164, Fig. 7A) to generate a predetermined superposition signal (to generate a stacked-carrier spread-spectrum transmitter output signal, see col. 10, lines 40-42 and transmitter output of element 170, Fig. 7A).

Regarding claim 3, Agee discloses the CI communication method recited in claim 1 wherein the steps of providing for redundant modulation and providing for reception comprise at least one of a set of transmission protocols including time-division multiple access, code-division multiple access (CDMA), frequency-division multiple access, time-offset multiplexing,

frequency-hopping spread spectrum, orthogonal frequency division multiplexing (OFDM), multi-tone CDMA, multi-carrier CDMA, OFDM-CDMA, synchronized CDMA, and phase-division multiplexing (OFDM-CDMA, see Figs. 7A and 7B).

Regarding claim 4, Agee discloses the CI communication method recited in claim 1 wherein the step of providing for spatial processing includes providing for multi-channel detection (detecting multi-channel at the splitter of the stacker-carrier spread-spectrum receiver for providing spatial processing after ADC of the stacked-carrier spread spectrum receiver, see elements 180, 181, Fig. 7B and col. 11, lines 19-21).

Regarding claim 5, Agee discloses the CI communication method recited in claim 1 wherein the step of providing for spatial processing includes providing for at least one superposition of the received signals (providing spatial processing after ADC for the superimoposed or stacked-carrier spread spectrum signal received at the stacked-carrier spread spectrum receiver, see col. 7, lines 2-4 and Fig. 7B).

Regarding claim 6, Agee discloses a CI transmission system including:

a carrier-signal generator (stacked-carrier spread spectrum transmitter, see Fig. 7A) capable of generating a plurality of carrier signals (see plurality of carrier signals generated after DAC, Fig. 7A),

a modulator (a spreader, see col. 30, lines 55-59) capable of redundantly modulating at least one information signal onto a plurality of the carrier signals (redundantly modulating a first

data with at least two of RF carriers, see col. 30, lines 56-59) wherein the improvement comprises at least one of the carrier-signal generator (stacked-carrier spread spectrum transmitter, see Fig. 7A) and the modulator being adapted to provide the modulated carrier signals with an incremental phase relationship (modulating the phase of RF carriers, see col. 30, lines 55-59) that facilitates separation of multiple information signals modulated onto the same carrier signals, and a transmitter (stacked-carrier spread spectrum transmitter, see Fig. 7A) having at least one transmitter element (see elements 232, 233, Fig. 8), the transmitter being capable of coupling the modulated carrier signals into at least one communication channel (a final summer combines the modulated carrier signals from all the channels and produces a transmitter output, see col. 10, lines 28-45 and element 170, Fig. 7A).

Regarding claim 7, Agee discloses the CI transmission system recited in claim 6 wherein the carrier-signal generator (stacked-carrier spread spectrum transmitter, see Fig. 7A) is adapted to generate carrier signals that are each distinguished by different values of at least one diversity parameter (generates carrier signals of different quadrature phases, see col. 10, lines 28-36).

Regarding claim 8, Agee discloses the CI transmission system recited in claim 6 wherein at least one of the carrier-signal generator, the modulator, and the transmitter (stacked-carrier spread spectrum transmitter, see Fig. 7A) includes a spatial processor adapted to effect spatial processing of at least one of the modulated carrier signals (provides spatial processing before the digital-to-analog conversion process (DAC) operation during the transmission operation, see col. 7, lines 4-6).

Regarding claim 9, Agee discloses a CI transmission system including:

a carrier-signal generator (stacked-carrier spread spectrum transmitter, see Fig. 7A) capable of generating at least one carrier signal (see col. 10, lines 22-30 and Fig. 7A);

a modulator (a spreader, see col. 30, lines 55-59) capable of redundantly modulating at least one information signal onto the carrier signal(s) (redundantly modulating a first data with at least two of RF carriers, see col, 30, lines 56-59) wherein the improvement comprises at least one of the carrier-signal generator and the modulator (the spreader) being adapted to provide the modulated carrier signal(s) with a phase relationship (modulating the phase of RF carriers, see col. 30, lines 55-59) that facilitates separation of multiple information signals modulated onto the same carrier signal(s), and

a transmitter (stacked-carrier spread spectrum transmitter, see Fig. 7A) having at least one transmitter element (see elements 232, 233, Fig. 8), the transmitter being capable of coupling the modulated carrier signals into at least one communication channel (a final summer combines the modulated carrier signals from all the channels and produces a transmitter output, see col. 10, lines 28-45 and element 170, Fig. 7A).

Regarding claim 10, Agee discloses the CI transmission system recited in claim 9 wherein the carrier-signal generator (stacked-carrier spread spectrum transmitter, see Fig. 7A) is capable of generating carrier signals that are each distinguished by different values of at least one diversity parameter (generates carrier signals of different quadrature phases, see col. 10, lines 28-36).

Regarding claim 11, Agee discloses the CI transmission system recited in claim 9 at least one of the carrier-signal generator, the modulator, and the transmitter (stacked-carrier spread spectrum transmitter, see Fig. 7A) includes a spatial processor adapted to effect spatial processing of at least one of the modulated carrier signals (provides spatial processing before the digital-to-analog conversion process (DAC) operation during the transmission operation, see col. 7, lines 4-6).

Regarding claim 12, Agee discloses a CI receiver system including:

a receiver (stacked-carrier spread spectrum receiver, see element 180, Fig. 7B) having at least one receiver element (splitter, see element 181, Fig. 7B), the receiver adapted to be responsive to a plurality of information-modulated carrier signals from at least one communication channel (stacked-carrier spread spectrum receiver receives a stacked-carrier transmitter output signal that is generated by summing a plurality of modulated carrier signals, see Fig. 7A) to generate a plurality of received modulated carrier signals (see received carrier signals generated after the splitter at the receiver, see Fig. 7B), and

a combiner (spatial processing is provided after the ADC of the receiver, see element 190, Fig. 7B and col. 7, lines 2-4) coupled to the receiver, the combiner capable of combining the received modulated carrier signals to separate at least one desired information symbol from at least one interfering signal (spatial processing allows interference excision against in-cell stacked-carrier spread spectrum signals, see col. 4, lines 63-67, and col. 5, lines 1-7).

Regarding claim 13, Agee discloses the CI receiver system recited in claim 12 wherein at least one of the receiver (stacked-carrier spread spectrum receiver, see element 180, Fig. 7B) and the combiner includes a spatial processor adapted to effect spatial processing of at least one of the received modulated carrier signals (provides spatial processing after the analog-to-digital conversion ADC process during the reception operation, see Fig. 7B).

Regarding claim 16, Agee discloses a CI receiver system including:

a receiver (stacked-carrier spread spectrum receiver, see element 180, Fig. 7B) having at least one receiver element (splitter, see element 181, Fig. 7B), the receiver capable of being coupled to at least one communication channel (splitter drives parallel several frequency-separated channels, see col. 11, lines 19-21 and element 181, Fig. 7B), the receiver adapted to be responsive to at least one carrier signal modulated with a plurality of information signals to generate at least one set of interfering information signals therefrom, and

a multi-channel detector coupled to the receiver, the multi-channel detector adapted to separate the interfering information signals (spatial processing is used after the ADC of the stacked-carrier spread spectrum receiver to provide interference excision against in-cell stacked-carrier spread spectrum signals as well as out-of-cell interferers, see col. 5, lines 2-7 and col. 7, lines 2-4).

Regarding claim 17, Agee discloses the CI receiver system recited in claim 16 wherein at least one of the receiver (stacked-carrier spread spectrum receiver, see element 180, Fig. 7B) and the multi-channel detector includes a spatial processor adapted to effect spatial processing of at

least one of the received modulated carrier signals (provides spatial processing after the analog-to-digital conversion ADC process during the reception operation, see Fig. 7B).

***Allowable Subject Matter***

2. Claims 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 14, the CI receiver system recited in claim 12 wherein the combiner includes a multi-channel detector adapted to separate at least one desired combined signal from at least one interfering signal.

In claim 15, the CI receiver system recited in claim 12 wherein the combiner includes a multi-channel detector adapted to separate at least one desired received modulated carrier signal from at least one interfering signal prior to combining.

***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure with respect to multiple input, multiple output carrier interferometry architecture.

US Patent 6,512,737 to Agee

US Patent 5,886,988 to Yun et al.

US Patent 5,642,353 to Roy et al.

US Patent 5,592,490 to Barratt et al.

US Publication 2001/0024475 to Kumar

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 703-305-5300. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 703-305-4366. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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